Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of claims:

1-25. (cancelled)

26. (currently amended) A spectrometric device for obtaining spectral information indicative of characteristics of an incident signal, said device comprising an optical element to divide said incident signal received at an input into a plurality of spectral bands, a signal converter for converting said spectral bands into a digital signal representative of the spectrum of said incident signal, and a processor to process said digital signal and generate an output indicative of characteristics of said incident signal, said processor including a digital signal processor operable to receive said digital signal representative of said spectrum and apply thereto spectrum reconstruction and enhancement algorithms and thereby augment said digital signal.

27. (previously presented) A device according to claim 26 wherein said optical element is a dispersive element in the form of a light diffraction grating.

28. (previously presented) A device according to claim 26 wherein said signal converter includes an array of photodetectors to convert said spectral bands into a voltage and an analog to digital converter to convert the voltage into a digital signal.

29. (previously presented) A device according to claim 27 wherein said signal converter includes an array of photodetectors to convert said spectral bands into a voltage and an analog to digital converter to convert the voltage into a digital signal.

30. (currently amended) A spectrometer as defined in claim 26 wherein said optical element, said signal converter and said processor are combined in a single integrated component. [comprises said transducer.]

31. (cancel)

32. (previously presented) A spectrometer as claimed in claim 26 wherein the processor comprises calibration means for retrieving spectral information relating to a known spectrum x_n^{cal} and for storing the data relating to the measured spectrum and the known spectrum in memory.

33. (previously presented) A spectrometer as defined in claim 32 wherein the processor comprises calibration means for receiving spectral data y_n^{cal} representative of the known spectrum x_n^{cal} for chosing the ideal peak $\upsilon_r(\lambda,1)$ and of projection operator G and reconstruction operator R for preprocessing the data y_n^{cal} for determining parameters pc of projection operator G and parameters $\rho\varepsilon$ of reconstruction operator R, and for storing in memory data $x(\lambda)$ to its known and substantially idealized spectrum $s(\lambda)$.

34. (currently amended) A spectrometer as defined in claim 33 wherein the processor is customized for use with the [transducer] signal converter.

35. (previously presented) A spectrometer as defined in claim 32 wherein the processor comprises means for estimating a vector of peaks 1 within a measured spectrum of a sample in dependence upon an estimate $\hat{s}(\lambda)$ of a known idealized spectrum $s(\lambda)$ of a same sample; means for estimating vector of magnitudes of the peaks a; and means for iteratively correcting the estimates of the vector of positions of the peaks and the vector of the estimate of their magnitudes.

36. (previously presented) A device according to claim 26 including a temperature sensor to determine the temperature of said optical element.

37. (currently amended) A device according to claim 36 wherein said temperature sensor is used to correct said digital signal[s] representative of said [imaged] spectrum of said incident signal.

38. (currently amended) A method of obtaining spectral information indicative of characteristics of an incident signal comprising the steps of dividing said incident signal into a plurality of spectral bands, converting said spectral bands into a digital signal representative of the spectrum of the incident signal, applying [to said digital signal] a spectrum reconstruction and enhancement algorithm[s] to said digital signal to augment said digital signal, and deriving from said augmented signal information indicative of characteristics of said incident signal.

39. (currently amended) A method according to claim 38 including the step of applying an incident signal of known spectra to a spectrometer, obtaining therefrom a digital signal representative of said incident signal, comparing said digital signal with that of said known spectra and determining calibration data from such comparison for use in obtaining information from other spectra.

40. (previously presented) A method according to claim 39 including the step of determining appropriate spectral enhancement methods from such comparison.

41. (previously presented) A method according to claim 39 including the steps of preprocessing both an incident signal of known spectra and an incident signal of unknown spectra by at least one of a plurality of signal processing techniques.

42. (previously presented) A method according to claim 39 including the step of applying calibration data to said augmented signal.

43. (previously presented) A method according to claim 38 including the step of measuring the temperature of optical elements used to divide said incident signal and correcting an imaged spectra in accordance with variations in said temperature.